

## **Current Status and Prospects for Acceptance in Russia of Spent Nuclear Fuel and Radioactive Waste**

Evgeny P. Velikhov, President of RRC "Kurchatov Institute"

Summary of the Paper to be presented at the  
**Nuclear Cooperation Meeting  
On Spent Fuel and High-Level Waste  
Storage and Disposal,**  
held by Lawrence Livermore National Laboratory

*Las Vegas, Nevada, March 7-9, 2000*

**The background.** The problem of SNF and RW management appears to be the key one in world nuclear power (NP) development. Among the countries developing the NP there are some unwilling to be engaged in the SNF and RW. At the same time, there exist some other countries willing to obtain an access to nuclear technologies involving SNF and RW management to use them in nuclear weapons production.

**Objective.** In order to limit drastically the concern of the countries unwilling to deal with SNF and RW management, of key importance is the creation of a number of International Technological Centers for handling these materials. Apparently, the availability of such Centers would benefit to the attractiveness of NP for many more countries. However, in order to prevent the nuclear proliferation threat, the number of these Centers should be limited. By our estimates, they should be 5 – 8 in number.

**Requirements for International Technological Centers.** These Centers should locate at well-protected sites, have acceptable geophysical, hydrology and seismic characteristics. Regarded as ideal could be the Centers' siting based on the existing nuclear power industry enterprises provided with all the appropriate infrastructure and highly-skilled personnel. Such a solution could contribute, particularly, to the conversion of both the personnel and the enterprises from the military activities to the civil ones.

**General Action Plan.** To start with establishing of SNF and RW management International Technological Centers it is reasonable is to create the retrievable storage facility for SNF with the storage term of 40 – 50 years. On the one hand, this could be a time-saving solution for making study and testing new SNF and RW management technologies with a view to fulfilling nuclear fuel cycle optimization and enhancing its safety. On the other hand, this could provide necessary fund for both the said works provision and the cold war after-effect overcoming primarily by the acceptance of foreign NSF and RW for temporary storage. In future, these International Centers could incorporate industrial storage facilities for high-level waste, installations for transmutation and waste compacting, SNF reprocessing plants, advanced storage facilities for low-level waste, MOX-fuel production plants and other facilities that could

be reasonably created resulting from the advanced technologies' R & D and testing.

**Technological initiative.** About a year ago, RRC "Kurchatov Institute" put forward the technological initiative on creation of the first International Center (IC) in Russia on the basis of Mining-and-Chemical Combine (former closed nuclear town "Krasnoyarsk-26"). This mining-and-chemical-combine-based SNF and RW management IC would meet the total range of criteria specified above.

**Legal Base.** At the same time, the fulfillment of this technological initiative needs essential changes in the applicable effective legislation. Currently we are drafting the bill on assurance of "Russia's Radiation Purity". This bill shall develop in detail Russia's radiation purity Program and its realization plan that is to include real sources of financial backing. If adopted, this new law shall set up a firm legal base needed for the technological initiative realization and for the creation of the first IC in Russia based on mining-and-chemical-combine. The newly elected State Duma deputies' outlook gives hope for early adoption of laws vital for Russia's radiation purity assurance.

**International Cooperation.** The creation of a series of SNF and RW management ICs may be crucial for building of general public confidence in nuclear power. Of key importance is to create these ICs in the countries proved to be indisputable technological leaders in nuclear power and nuclear fuel cycle. The creation of SNF and RW management ICs network should be grounded on confidence among the nuclear power countries and nuclear & radioactive materials records and control.